

REMARKS

Amendments

The specification has been amended to provide serial number information at page 11 as requested. An obvious grammatical correction has also been carried out by amendment.

Claim 1 has been amended to specifically recite that the charge control adjuvant is present in the liquid toner composition in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations. Antecedent basis for this amendment is located in the specification at page 9, lines 9-13.

Claim Rejections – 35 USC § 103

Claims 1, 6, 7, 10-16, and 18-21 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kosel in US Patent 3,753,760 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-255.

The present invention relates to liquid toner compositions comprising particles comprising amphipathic copolymers. The toner compositions as claimed comprise a plurality of positively charged toner particles dispersed in the liquid carrier. Thus, the toner particles are already charged, i.e. already have a charge director (if necessary) associated with the toner particles. See page 28 of the present specification at lines 8-12.

The present invention describes providing an element to the toner composition in addition to the charge director (i.e. in addition to the component that provides a charge to the particle). This additional element is not present to charge the particle, but instead is present to provide exceptional charge control benefits to the toner composition. It has surprisingly been found that by addition of acid or base components to positively charged toner particles as described in the present specification, bulk conductivity and preferably charge per mass are reduced during printing operations, providing superior imaging performance. As noted in the specification at page 9, lines 2-13, it is believed that the adjuvant as described in the specification and claims selectively coordinates with counterions in the toner composition, possibly including counterions previously associated with the charge directors that are associated with the toner particles. Surprisingly, the charge control adjuvant reduces the bulk conductivity of the liquid toner composition and preferably simultaneously reduces the charge per mass of the toner particles.

This charge effect, both in bulk conductivity and preferably in charge per mass, is of particular benefit during printing operations, providing an excellent charge balance in the toner system even as toner concentrations change as toner is depleted.

The effectiveness of use of an additional charge control adjuvant is demonstrated in the Examples beginning at page 39, wherein simple addition of charge control adjuvant to a conventional toner composition that was identified to be depleted resulted in reduction in conductivity and the ability to print to provide good optical density.

Kosel discloses liquid toners prepared using amphipathic copolymers. Kosel does disclose the use of charge directors (in particular, metal soaps), as is conventional in the toner art. Kosel does not teach or suggest the use of an additional element in the toner composition that is an acid or base, present in an amount to effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Diamond and Weiss is a handbook that teaches the use of conventional materials for liquid toners, including the use of charge directors. This reference thus clearly describes only the use of a charge director to impart a charge on the particle, and does not teach or suggest the use of an element in addition to a charge director that is a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Thus, even in combination, the Kosel and the Diamond and Weiss references both teach the use of charge directors to impart a charge to toner particles, and individually and in combination fail teach the use of a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Claim 17 has been rejected under 35 U.S.C. (103(a) as being unpatentable over Kosel in U.S. Patent 3,753,760 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-255 as applied in claims 1, 6, 7, 10-16, and 18-21 above, and further in view of Roteman et al. in US Patent 3,411,936.

Roteman is cited for its teaching regarding the use of specific chemicals as charge directors.

Claim 17 is directed to preferred embodiments of the present invention wherein the charge director is specified. As discussed above, the charge director is a distinct element from the charge control adjuvant.

It is acknowledged that tin and zirconium carboxylates are known in the toner art for their use as charge directors. The subject claim recites these compounds in their use as charge directors. However, claim 17 is patentable because it claims the use of these charge directors in toners comprising amphipathic copolymers, and additionally wherein the toner composition comprises a distinctly separate charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Because the Roteman patent does not bridge the gap noted above in the Kosel and Diamond and Weiss references relative to the charge control adjuvant, it is respectfully submitted that claim 17 is also allowable.

Claims 8 and 9 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kosel in US Patent 3,753,760 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-255 as applied to claims 1, 6, 7, 10-16, and 18-21 above, and further in view of Tamai et al. in US Patent 4,062,789.

The Tamai reference is cited for its recitation of certain acids in toner particles. The Tamai reference does not use the now conventional "charge director" nomenclature, and so one must look to the nature of the use of the materials described in Tamai to determine their function in the toner compositions described therein. The acid as disclosed in Tamai is the material used to impart a charge to the toner particle. See column 3, lines 1-4. This portion of Tamai only provides teaching relative to liquid toners that use specific compounds as what we now call "charge directors."

Tamai additionally notes that an organic acid can optionally be incorporated to preserve stability of certain charge controlling agents in the carrier liquid. See column 3 at lines 36-39 and 53-57. Thus, these acids appear to act as a sort of solubilizer for the charge controlling agent, and additionally can strengthen the positive charge of the toner particles. See column 3, lines 48-51. The Tamai patent does not teach or suggest the use of a distinctly separate charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Because the Tamai patent does not bridge the gap noted above in the Kosel and Diamond and Weiss references relative to the charge control adjuvant, it is respectfully submitted that claims 8 and 9 are also allowable.

Claims 1, 6, 7, and 10-21 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al. in US Patent Application Publication 2004/0091807 or Qian et al. in US Patent Application Publication 2004/0091808 or Qian et al. in US Patent Application Publication 2004/0091809 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-257.

Each of the Qian references describes liquid toner compositions comprising particles made incorporating amphipathic copolymers. The copolymers of Qian '807 comprise soluble high Tg monomers, the copolymers of Qian '808 comprise crystallizable moieties, and the copolymers of Qian '809 have a Tg greater than 55°C at the D material portion thereof. These toner compositions use conventional charge director chemistry as discussed above, and, as acknowledged in the Office Action, do not use a distinctly separate charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

As discussed above, the Diamond and Weiss handbook teaches only the use of conventional materials for liquid toners, including the use of charge directors. This reference does not teach or suggest the use of an element in addition to a charge director that is a charge control adjuvant that is an acid or a base present in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations.

Because none of the above cited references teach or suggest the concept of a charge control adjuvant that is an acid or a base in a liquid toner composition in an amount effective to reduce the bulk conductivity of the liquid toner composition as toner is depleted during printing operations, the combination of these references do not render the present claims obvious.

Double Patenting

Claims 1-21 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 10/676381 in view of *Handbook of Imaging Materials* to Diamond & Weiss (eds.) New York: Marcel-Dekker, Inc. (11/2001) pp. 242-247, 254-257.

In order to overcome this provisional rejection and to expedite prosecution, a terminal disclaimer in view of copending Application No. 10/676,381 is enclosed without prejudice.

CONCLUSION

In view of the above remarks, it is respectfully submitted that the foregoing is fully responsive to the outstanding Office action. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any issues in the application, the Examiner is invited to contact said attorney at (651) 275-9811.

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Respectfully Submitted,

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